

CLAIMS

What is claimed is:

1. A secondary battery comprising:
an electrode unit having a positive electrode plate, a negative electrode plate and a separator disposed therebetween;
a can having a bottom portion and in which the electrode unit and an electrolytic solution are accommodated and sealed, the can comprising aluminum or an aluminum alloy; and
a layer provided on at least an outer surface of the bottom portion of the can.
2. The secondary battery of claim 1, wherein the layer has at least nickel as a main component.
3. The secondary battery of claim 2, wherein the layer is formed by at least one method selected from the group consisting of electrolytic plating, electroless plating and sputtering.
4. The secondary battery of claim 1, wherein the layer has at least copper as a main component.
5. The secondary battery of claim 4, wherein the layer is formed by at least one method selected from the group consisting of electrolytic plating, electroless plating, sputtering and cladding.
6. The secondary battery of claim 1, further comprising a safety device and a lead unit which connects the positive and negative electrode plates through the safety device, the lead unit comprising a lead electrically connected to the safety device and which is welded to the layer.
7. The secondary battery of claim 6, wherein the lead is welded to the layer by resistance welding.

8. The secondary battery of claim 7, wherein the layer comprises a first material, the lead comprises a second material other than the first material, and a melting point difference between the first and second materials is 500 °C or less.

9. The secondary battery of claim 8, wherein a melting point difference between the first and second materials is 200 °C or less.

10. The secondary battery of claim 4, further comprising a safety device and a lead unit which electrically connects the positive and negative electrode plates through the safety device, the lead unit comprising a lead electrically connected to the safety device and which is adhered to the layer by soldering.

11. The secondary battery of claim 1, wherein the layer has a thickness of 0.5 µm to 200 µm.

12. The secondary battery of claim 11, wherein the layer has a thickness of 30 µm to 100 µm.

13. The secondary battery of claim 1, further comprising a metal layer between the layer and the outer surface of the bottom portion of the can, wherein the metal layer comprises a first material, the can comprises a second material including the aluminum or the aluminum alloy, the layer comprises the second material, and the second material is different from the first material.

14. The secondary battery of claim 13, wherein the first material of the metal layer comprises at least one material selected from the group consisting of Zn, Sn, Fe and Cr.

15. The secondary battery of claim 1, wherein a thickness of the bottom portion of the can is in the range of 0.2 mm to 0.8 mm.

16. The secondary battery of claim 1, wherein the layer is formed partially or entirely at the outer surface of the can.

17. A secondary battery comprising:

an electrode unit having a positive electrode plate, a negative electrode plate and a separator disposed therebetween;

a can having a bottom portion and in which the electrode unit and an electrolytic solution are accommodated and sealed, the can comprising aluminum or an aluminum alloy;

a cap assembly sealing an opening of the can and having a cap plate insulated from the positive and negative electrode plates of the electrode unit, the cap plate comprising aluminum or an aluminum alloy; and

a layer provided on at least an outer surface of the cap plate.

18. The secondary battery of claim 17, wherein the layer comprises at least nickel as a main component.

19. The secondary battery of claim 18, wherein the layer is formed by at least one method selected from the group consisting of electrolytic plating, electroless plating and sputtering.

20. The secondary battery of claim 17, wherein the layer comprises at least copper as a main component.

21. The secondary battery of claim 20, wherein the layer is formed by at least one method selected from the group consisting of electrolytic plating, electroless plating, sputtering and cladding.

22. The secondary battery of claim 17, further comprising a safety device and a lead unit which electrically connects the positive and negative electrode plates through the safety device, the lead unit comprising a lead electrically connected to the safety device and is welded to the layer.

23. The secondary battery of claim 22, wherein the lead is welded to the layer by resistance welding.

24. The secondary battery of claim 23, wherein the layer comprises a first material, the lead comprises a second material other than the first material, and a melting point difference between the first and second materials is 500 °C or less.

25. The secondary battery of claim 24, wherein a melting point difference between the first and second materials is 200 °C or less.

26. The secondary battery of claim 20, further comprising a safety device and a lead unit which electrically connects the positive and negative electrode plates through the safety device, the lead unit comprising a lead electrically connected to the safety device and is adhered to the layer by soldering.

27. The secondary battery of claim 17, wherein the layer has a thickness of 0.5 µm to 200 µm.

28. The secondary battery of claim 27, wherein the layer has a thickness of 30 µm to 100 µm.

29. The secondary battery of claim 17, further comprising a metal layer between the layer and the outer surface of the cap plate, wherein the metal layer comprises a first material, the cap plate comprises a second material including the aluminum or the aluminum alloy, the layer comprises the second material, and the second material is other than the first material.

30. The secondary battery of claim 29, wherein the first material of the metal layer is made of at least one material selected from the group consisting of Zn, Sn, Fe and Cr.

31. The secondary battery of claim 17, wherein a thickness of the cap plate is in the range of 0.2 mm to 0.8 mm.

32. The secondary battery of claim 17, wherein the layer is formed partially or entirely at the outer surface of the cap plate.

33. A method of manufacturing a secondary battery comprising:
forming an electrode unit by providing a positive electrode plate and a negative electrode plate and interposing a separator therebetween;
accommodating the electrode unit and an electrolytic solution inside a can having a bottom portion and sealing the can, the can comprising a first material;

forming a metal layer of a second material other than the first material on an outer surface of the bottom portion of the can by pre-treatment; and

forming a surface coating on the outer surface of the bottom portion of the can having the first metal layer.

34. The method of claim 33, further comprising screening portions other than the outer surface of the bottom portion of the can where the metal layer is formed before performing the pre-treatment.

35. The method of claim 33, wherein the forming of the surface coating is performed by at least one method selected from the group consisting of electrolytic plating, electroless plating, sputtering and cladding.

36. A method of manufacturing a secondary battery comprising:

forming an electrode unit by providing a positive electrode plate and a negative electrode plate and interposing a separator therebetween;

accommodating the electrode unit and an electrolytic solution inside a can having a bottom portion;

sealing the can with a cap plate insulated from either electrode of the electrode unit, the cap plate comprising a first material;

forming a metal layer of a second material other than the first material on an outer surface of the cap plate by pre-treatment; and

forming a surface coating on the outer surface of the cap plate having the second metal layer.

37. The method of claim 36, further comprising screening portions other than the outer surface of the bottom portion of the can where the metal layer is formed before performing the pre-treatment.

38. The method of claim 36, wherein the forming of the surface coating is performed by at least one method selected from the group consisting of electrolytic plating, electroless plating, sputtering and cladding.

39. A battery comprising:

a generation element which generates electrical power;
a can having a surface made of a first material and which houses the generation element, a first terminal electrically connected to the generation element and a second terminal disposed at the surface and which is electrically connected to the generation element; and
a layer provided on the surface and comprising a second material other than the first material, the second material comprising at least nickel as a main component.

40. The battery of claim 39, further comprising a safety device and a lead unit which electrically connects the first terminal and the second terminal through the safety device and having a lead with one end disposed at the surface and another end disposed at the safety device.

41. The battery of claim 40, wherein the lead is welded to the layer by resistance welding.

42. The battery of claim 40, wherein:
the lead comprises a third material; and
a melting point difference between the second material and the third material is 500 °C or less.

43. The battery of claim 42, wherein the melting point difference between the second and third materials is 200 °C or less.

44. The battery of claim 41, wherein the lead is connected to the layer by soldering.

45. The battery of claim 39, wherein the layer has a thickness of 0.5 µm to 200 µm.

46. The battery of claim 45, wherein the layer has a thickness of 30 µm to 100 µm.

47. The battery of claim 39, further comprising a metal layer between the layer and the surface, wherein the metal layer comprises a third material other than the first and second materials.

48. The battery of claim 47, wherein the third material comprises at least one material selected from the group consisting of Zn, Sn, Fe and Cr.

49. The battery of claim 39, wherein the can comprises side surfaces connected to the surface at corresponding boundaries, and the layer extends entirely between the boundaries on the surface.

50. The battery of claim 39, wherein the can comprises side surfaces connected to the surface at corresponding boundaries, and the layer extends between the boundaries on the surface such that the layer does not cover a portion of the surface.

51. The battery of claim 39, wherein a thickness of the surface is in a range of 0.2 mm to 0.8 mm.

52. The battery of claim 39, wherein the can comprises a cap plate sealing an opening in the can through which the generation element is disposed in the can, and the surface is not on the cap plate.

53. The battery of claim 39, wherein the can comprises a cap plate sealing an opening in the can through which the generation element is disposed in the can, and the cap plate includes the surface.

54. The battery of claim 42, wherein the can comprises a cap plate sealing an opening in the can through which the generation element is disposed in the can, and the cap plate includes the surface.

55. The battery of claim 47, wherein the can comprises a cap plate sealing an opening in the can through which the generation element is disposed in the can, and the cap plate includes the surface.

56. The battery of claim 39, wherein the layer is formed by coating the second material on the surface.

57. The battery of claim 56, wherein the layer is formed by at least one method selected from the group consisting of electrolytic plating, electroless plating and sputtering.

58. The battery of claim 39, wherein the first material comprises at least aluminum as a main component.

59. A method of manufacturing a secondary battery, comprising:
coating a layer on a surface of a can of the secondary battery, the layer comprising a second material other than a first material of the can, and the can housing a generation element which generates electrical power; and
attaching a lead to the coated layer, the lead being connected to a safety device of the battery,
wherein the safety device is electrically connected between positive and negative terminals of the generation element using a lead unit including the lead.

60. The method of 59, further comprising disposing another layer of a third material other than the first and second materials prior to coating the layer on the surface of the can, wherein the coating the layer on the surface of the can comprises coating the layer on the another layer.

61. The method of claim 59, wherein the can comprises a cap plate comprising the surface and sealing an opening in the can through which the generation element is disposed in the can, and the coating the layer comprises coating the layer on the cap plate.

62. The method of claim 59, wherein the can comprises a cap plate sealing an opening in the can through which the generation element is disposed in the can, and the coating the layer comprises coating the layer on the surface not on the cap plate.

63. The method of claim 59, wherein the coating the layer comprising coating the layer using an electroless plating method.

64. The method of claim 59, wherein the coating the layer comprising coating the layer using an electrolytic plating method.

65. The method of claim 59, wherein the coating the layer comprising coating the layer using a sputtering method.

66. The method of claim 59, wherein the coating the layer comprising coating the layer using a cladding method.